

Physics Colloquium

Michigan Technological University

Thursday, January 18, 2007

4:00 - 5:00 pm

Room 139, Fisher Hall

Magnetic Domains in Nanostructured Magnetic Photonic Crystals

Xiaoyue Huang

Department of Physics
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(Advisor: Professor Miguel Levy)

ABSTRACT

Photonic crystal structures in ferromagnetic films can generate photonic band gaps with resonant transmission peaks, and substantially enhance the magneto-optic polarization rotation through the crystal. Studies of dimensionality effects on the magnetization within the photonic crystal reveal interesting magnetic domain formations due to the reduced geometry in the structure. These dimensionality effects and the corresponding changes in polarization rotation, which depends on the magnetization in the photonic band gap structure, are investigated both experimentally and theoretically and will be presented in this talk.

Spectroscopy of Mica Substrates with and without Water Films Atop

Eli Ochshorn

Department of Physics
Michigan Tech University
(Advisor: Professor Will Cantrell)

ABSTRACT

My primary research area involves the use of infrared spectroscopy to study water which is adjacent to other materials, and how the molecular properties of these interfaces vary with temperature. These results are in general relevant to understanding how the freezing of water is catalyzed by contact with various substances (e.g., dust, bacteria, soot, an ice tray, etc.) However, the results that I will focus on for this talk are specific to sensitivities to temperature and pressure of the optical/molecular properties of some mineral sheets themselves, which serve as substrates for water films. Because the water film/substrate systems are probed by an infrared beam while conditions are varied, these results are critical for being able to differentiate between the optical responses from the water and the substrate. I will also discuss some preliminary results concerning the properties of the water films which are condensed on the substrates.

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